REMARKS

In response to the Office action dated November 19, 2003, in which the Examiner finally rejected claims 1-11 and 21-23, all of the claims pending in the application, applicants request reconsideration and reexamination in light of the following remarks and the accompanying declaration of Sadashiv Nadkarni pursuant to 37 C.F.R. § 1.132. The remarks and the declaration make clear that the claimed invention is patentable over the cited references of record. Notice of the allowability of the pending claims is respectfully requested.

The § 102 (b) Rejection

The Examiner has rejected claims 1, 5, 7, 10 and 11 under 35 U.S.C. § 102 (b), asserting that these claims are anticipated by Toma. The Examiner states that Toma teaches an example of an aluminum alloy suitable for fin material for tubes for a heat exchanger comprising Mn, Si, Fe, Mg, and Cu in ranges that overlap those contained in the rejected claims. Further, the Examiner notes that Toma recites a narrow range of Fe that overlaps that recited in the claims. The Examiner admits that Toma contains Zr in his alloy, but argues that the use of the transitional phrase "consisting essentially of" by applicants in their claims limits the scope of a claim to the specified materials or steps, "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. The Examiner asserts that the

addition of Zr would not materially affect the basic and novel characteristics of the claimed invention. Therefore, the rejection is deemed proper by the Examiner.

Applicants respectfully traverse this rejection. Applicants submit that the Examiner has misconstrued the term "consisting essentially of" by adding an element from a reference that the reference clearly states has an important function in the properties of the Toma alloy. There is simply no basis in law or fact to include Zr in applicants claimed invention, particularly in view of the undisputed disclosure in Toma that addition of the specified amount of Zr has a marked effect on the properties of the alloy.

A plain reading of the Toma reference serves to undercut the Examiner's assertion. According to Toma, Zr is added to improve the high temperature sag resistance of the fins and must be present in the range of 0.02% to 0.2% to have the desired effect on the strength of the fins made by Toma ('632 patent, col. 4, lines 45-63). In view of this disclosure in Toma, the addition of Zr to an aluminum alloy for use as fins in automotive air conditioning heat exchangers cannot be viewed as having no material effect on the basic characteristics of the claimed alloy. The Toma reference itself explicitly states that it has a noticeable effect on the properties of an alloy. The Examiner cannot merely sweep aside or ignore this highly pertinent disclosure in order to create a §102 anticipation rejection. It is plainly improper for the Examiner to ignore this teaching of Toma, as an anticipation rejection must be based upon a fair and unstrained reading of the reference as a whole. Applicants

respectfully request, therefore, that the pending anticipation rejection be reconsidered and withdrawn.

Further, the present invention arises from a careful effort to control grain size in order to improve sag resistance in an alloy for use in auto air conditioning fin stock for brazing applications. Brazed systems feature a clad tube and a fin brazed together at temperatures exceeding about 600°C. Such extreme temperatures can cause sagging in fins. The present invention overcomes this problem by providing an alloy having sufficient grain size to have adequate sag resistance, without unduly compromising other important properties such as rollability and formability.

Despite the Examiner's assertion and the unmistakeable teaching of Toma, applicants have found that adding Zr adversely affects the sag resistance of the fin material because of its tendency to decrease grain size. Such an approach further undercuts the Examiner's assertion of anticipation, suggesting that the outstanding anticipation rejection should be withdrawn.

The § 103 (a) Rejections

The Examiner has rejected claims 1-11, 21 and 23 under 35 U.S.C. § 103 (a) as being unpatentable over Sircar. The Examiner asserts that Sircar teaches an aluminum alloy that has overlapping ranges with the claimed invention. The Examiner admits that Sircar teaches that no Mg is present in examples A-K in Table 1, but includes Ti in the alloy discussed in his patent. The Examiner discounts the presence of Ti, asserting that the presence of Ti does not materially affect the basic and novel characteristics of the claimed invention. Further, the Examiner states that Sircar teaches that his Al-Mn-Fe-Si alloy exhibits improved combinations of corrosion resistance and hot formability, and that Mg is believed to adversely impact certain brazing operations, and should be maintained at less than 0.1%. The Examiner concludes that since Sircar teaches a substantially overlapping alloy composition, complete with motivation to select the present claimed narrow ranges of Cu and Mg, Sircar creates a *prima facie* case of obviousness.

Once again, applicants traverse the rejection, and submit that Sircar does not provide a proper basis for rejecting the foregoing claims for obviousness, either alone or in combination with any of the references of record. As discussed above, the present invention provides an alloy suitable for use in manufacturing automobile air conditioning heat exchangers using aluminum alloy fin material brazed to tubing. In automobile air conditioning heat exchangers, as contrasted with fins for residential cooling units, the fin and tube combination after brazing must provide structural

strength and integrity, while minimizing weight. To accomplish this, the fin alloy must have sufficient sag resistance to maintain its shape even after brazing at temperatures of about 600°C. Applicants have taken an unconventional and unobvious approach to this problem: they have increased grain size sufficiently so that the fins avoiding sagging, but not so much that the fins become brittle or become difficult to roll or form. Increasing grain size provides fewer grain boundaries to permit sagging, and has the salutary and desired effect of providing a lightweight alloy having sufficient sag resistance for use in automotive air conditioning heat exchangers without becoming unduly brittle or difficult to roll.

The addition of Ti (and Zr), as suggested by the Examiner decreases grain size and therefore has the opposite effect on the alloy. As set forth in the accompanying Rule 132 declaration of Mr. Sadashiv Nadkarni, an expert in this field employed by Alcan, the addition of Ti and Zr to the alloy of the present invention would have a deleterious effect on properties of the alloy and would probably render it unfit to carry out its intended purpose. Adding Ti or Zr, as set forth in the declaration and in the authoritative treatise cited to therein, would reduce grain size, causing the alloy to have decreased sag resistance. Such an effect would diminish the structural integrity of the heat exchanger, making it unsuitable for use as a brazed heat exchanger in automotive air conditioners.

Additional differences reinforce the conclusion that the present invention would not have been obvious based upon the Sircar reference. The present

application teaches and claims a lower limit on Si that is substantially higher (at 0.25%) than that taught by the Sircar reference. Sircar teaches a preferred Si level of not more than 0.06 %. In the present case, the higher Si minimum is selected (see application page 9, first paragraph) to correct a smut (reaction product) problem that occurs during cold rolling of these materials, and is largely related to continuously cast material. The Sircar reference provides no such direction, so applicants submit that Sircar teaches away from the claimed invention for this reason as well.

The Examiner has also rejected claims 4, 6, 8-9, and 21-23 under 35 U.S.C. § 103(a), as being unpatentable over Toma. The Examiner asserts, concerning claims 4 and 6, that Toma teaches an aluminum alloy suitable for fin material for tubes for a heat exchanger comprising Mn, Si, Fe, Mg, and Cu in the ranges set forth in Table 1 contained in the office action. The Examiner asserts that the ranges of elements noted above overlap with the ranges contained in the claimed invention. The Examiner asserts that because of the overlap, the Toma reference establishes a *prima facie* case of obviousness.

The comparison set forth by the Examiner, however, omits a critical difference discussed above in connection with the anticipation rejection: that the Toma alloy contains Zr, while applicants' alloy omits Zr. As mentioned above, this deliberate alloy design choice imparts important differences to applicants' alloy. First, the omission of Zr by applicants, or its inclusion by Toma, affects the density of the alloy.

Since applicants sought to minimize the density of their alloy in order to maintain the desired lightness, this important characteristic cannot be overlooked in determining the obviousness of the claimed invention. Further, Zr decreases grain size, which decreases sag resistance in the alloy.

In sum, applicants' alloy differs in important and unobvious ways from the alloy discussed in Toma. These differences, notably the absence of Zr or Ti, cast doubt on the Examiner's assertion that the claimed invention would have been obvious in view of Toma or Sircar because of allegedly insubstantial differences between the cited references and the claimed invention. Indeed, Toma and Sircar indisputably teach away from the claimed invention by stressing the necessity of Zr and Ti in fabricating an aluminum alloy having improved sag resistance.

For essentially the same reasons, the product-by-process claims (claims 21-23) should be allowable over Toma. The product of the process differs from the alloy of Toma, as set forth above, so claims directed to a process for making such an alloy product should also be allowable based upon those differences.

Applicants submit that they have demonstrated that the rejections lodged by the Examiner are misplaced, and should be reconsidered and withdrawn. Early notification to that effect is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required in consideration of this filing and to credit any overpayment to our Deposit Account No. 03-3125.

Respectfully submitted,

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I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to:

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